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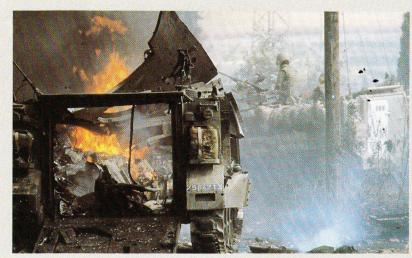
- * The Key Weapons: A weekly in-depth profile of one of the weapons or weapons systems that have changed the modern battlefield planes like the Phantom and the Harrier, tanks like the Centurion, smallarms, ships, missiles.
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- * The Inside Stories: The problems of flying a modern fighter, how it actually feels to lead a platoon into battle the reality of war from the men who took part.
- * The Tactics: Why guerrilla fighters have been so successful, how tanks operate during street fighting, what air support means to infantry.

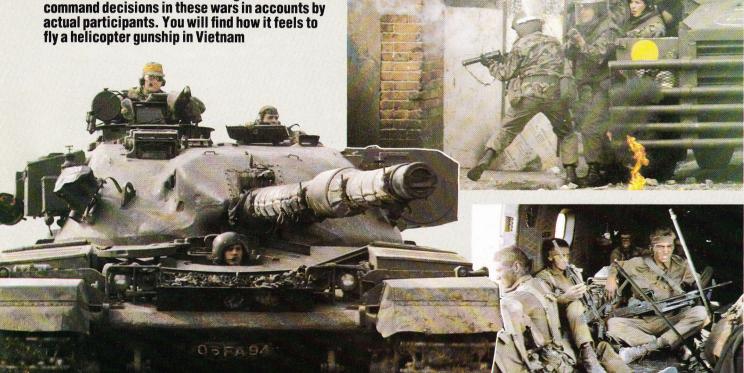
War In Peace is issued weekly and builds up into the most comprehensive study available on the conflicts that have shaped our times.

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In 1945 World War II ended, but peace was as far off as ever. There may have been no other world war since then, but there has always been fighting taking place somewhere – from Vietnam to the Falklands, from Korea to Afghanistan, from Malaya to the Lebanon. These wars, the wars of our generation, have been among the biggest in human history, and they have been accompanied by extraordinary technical developments in the power of weaponry.

War in Peace presents this story as it has never been told before. Week by week it provides a history of warfare from 1945 onwards, beginning with the epic confrontations of the 1940s, and taking the story to the present day; it details the weapons that have shaped these struggles, the smallarms, tanks, aircraft, and ships; it traces the tactical and strategic background – the principles of armoured warfare, or aerial combat in supersonic jets; and it shows what it was like to fight or make command decisions in these wars in accounts by actual participants. You will find how it feels to fly a helicopter qunship in Vietnam

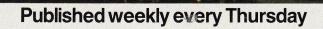




or how men react when they come face to face with death.

War in Peace is written by some of the world's leading military historians, assisted by an editorial board of unrivalled expertise. It tells an exciting, sometimes grim, but always absorbing story. If you want to know about the men and the weapons that have shaped our world or the wars that are taking place today, then War in Peace is for you.

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FOREWORD

By James L. Collins, Jr.

Brigadier General (Retired), Former Chief of Military History, US Department of the Army

Throughout recorded history the world has seldom been without war, greater or lesser, declared or undeclared. From the time Joshua toppled the walls of Jericho to the Falklands conflict in the South Atlantic, major international disturbances, small wars or actions 'less than wars' have circled the globe from East to West and North to South. Only the continent of the Antarctic has remained so far relatively untouched. While implements of war have advanced somewhat from Joshua's trumpet and sword to missiles which home in on electromagnetic radiation, the basic ingredient – man – has remained largely the same.

Caught up in his emotions, his hopes and his fears, his need to eat, to love, to sleep and to be protected from the elements, modern man is not too different from the gatherers and hunters of prehistory. And nowhere is this brought out more clearly and more strikingly than in the lethal conflicts that have raged throughout the world since 1945.

These fights may vary in appearance – indeed their levels of violence and terror tend to be proportional to the sophistication of the societies involved – yet part of their fascinating variety lies in the new and imaginative use of old weapons coupled with modern technology, and the way that men have employed these weapons in extremes of danger and at the limits of endurance.

War in Peace covers all of the more famous as well as the lesser post-World War II conflicts, from guerrilla struggles to clashes between states. During this period these wars have taken place under the towering shadow of nuclear holocaust. In some cases they have occurred as wars of proxy, fought in the way they were precisely because the vital interests of the nuclear powers were only marginally involved and the violence of the atom could not be

invoked without triggering Armageddon; thus, it can be said, the nuclear stalemate has in some cases spawned lesser conflicts.

Now you can be the judge yourself as to the nature of the seemingly endless conflicts that have embroiled the world from the 1940s to the 1980s. The equipment used by each side is described and illustrated in great completeness here; battle action and the political leanings of the leaders, both military and civilian, are depicted by rare photographs and in personality sketches; while the tactics and techniques are conveyed in vivid detail. And, I warn you, the conclusions drawn are sometimes controversial – but always take account of the latest research.

Your enjoyment of *War in Peace* will be enhanced if you keep at the back of your mind the larger questions. Why was this war fought? Who were the behind-the-scenes instigators? Whose power position was changed as a result of the war?

I am confident that you will find each issue full of interest – and difficult to put down. You will find a wealth of detail about the men, the weapons and the tactics, about heroism, skill and military expertise. You will find yourself referring back to earlier chapters as you peruse the most recent one to compare, to seek similarities and differences and to see how man has progressed or regressed in recent times. May you discover, in reading *War in Peace*, as much fascination and revelation as I have found in its planning.

James L. Colleins, Ja

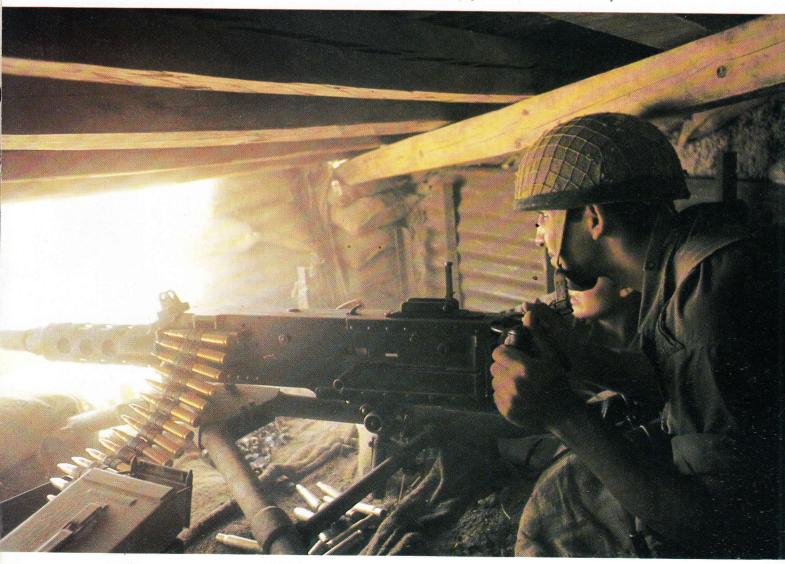
Introduction: an overview of WAR SINCE 1945

With the dropping of atomic bombs on Hiroshima and Nagasaki in August 1945 the world entered the nuclear age and has been living uneasily ever since. The terrible destructive power of the new weapon first demonstrated in Japan, has overshadowed all military affairs since the end of World War II. At the same time the world has been divided into two hostile camps led by the two superpowers, America and Russia, each armed with nuclear weapons. Despite this division, however, and the tensions arising from the dissolution of colonial empires, the nuclear weapon has never been used as an instrument of war, although 'old-fashioned' conventional warfare has never ceased. There has been peace - an uneasy peace, it is true, but peace nevertheless - between the major powers since 1945. But there has not been a single day since then when fighting of some kind has not been going on somewhere in the world. At least 150 large-scale armed conflicts have occurred since World War II; somebody has always been fighting someone.

Wars have not only become more frequent under the umbrella of the nuclear stalemate; they have also become more diversified. The levels of fighting have ranged from the simple, impoverished guerrilla crouching in the bush with a stolen rifle, hoping that his ammunition will last out, to the fighter pilot flying at supersonic speeds and controlling highly sophisticated electronic equipment capable of delivering weapons costing millions of pounds. Some wars are fought by small groups of ill-trained but highly politically motivated men; their opponents are often well trained professional soldiers, inspired mainly by a sense of duty and discipline.

This is the first, central, paradox of modern war: that, although nuclear weapons have never been used, beneath the protective wing of 'mutual deterrence' conventional warfare has never ceased and has in fact become more frequent and more destructive as the years have passed. The relationship between these two forms of military power, the nuclear chiefly

In spite of the technical advances made since 1945. the human face of war has not essentially changed. In the front line, men still have to face death and be prepared to kill in their turn. like this Israeli in the Six-Day War (below). What has changed, of course, is the capability of the weapons systems, like the McDonnell Douglas Phantom (above right). Such aircraft can carry a payload that dwarfs that of whole squadrons of World War II planes.



latent, the conventional ever-active, has been a constant and so far unsolved puzzle.

A second paradox concerns other characteristics of modern weapons. On the one hand their destructive potential has increased immensely; obvious in the case of nuclear weapons, this is also true in the conventional arena, with new explosives, shaped charges and fuel-air explosives which spread and ignite vast aerosol clouds. Yet, at the same time, the capacity to control these weapons and to be selective in their use has also expanded greatly – for example, in the vastly improved accuracy with which weapons can be delivered, whether we consider the wireguided anti-tank missile or the terrain-following Cruise missile with an accuracy of some 30m (35 yards) at intercontinental ranges. Such accuracy permits the limitation of damage and means that the need for indiscriminate attacks on civilian targets is much reduced.

Accuracy, however, is only one of several technological trends permitting the more discriminate use of weapons – new methods of reconnaissance and surveillance, for example, afford better target acquisition. But technology does not provide all the new



Supermarine Spitfire Mk 1X

type interceptor/close support fighter bomber range (combat radius) 700km (435 miles), with auxiliary tanks fitted 1577km (980 miles) speed 669km/h (416mph) armament 4 x 20mm cannon, rockets, 454kg (1000lb) bomb-load crew 1

Harrier GR 3

type V/STOL interceptor/ close support fighter bomber range (combat radius) 667km (414 miles), with one in-flight refuelling 5560km (3455 miles) speed 1186km/h (737mph) armament 2 x 30mm Aden guns, rockets, gunpods, Sidewinder AAMs, flares, 2268kg (5000lb) bomb-load crew 1 (A full profile of the Harrier appears on page 63)

The changing shape of the fighter: from Spitfire to Harrier

The combat capabilities of today's air superiority fighters, such as the McDonnell Douglas F-15, would be beyond the wildest dreams of the Spitfire-flying pilot of the Battle of Britain. Nonetheless the Spitfire was arguably the finest fighter plane of World War II and much of its success lay in its ability to be updated in the light of new developments in aviation. Thus when most of the aircraft of 1940 had gone to the breaker's yard, the Spitfire was still in service in the late 1940s, seeing combat in the Greek Civil War and in Palestine.

However, the future lay not with the 'conventional' internal combustion engine that powered the Spitfire but with the new jet

propulsion system. The dramatic increase in power and speed made possible by the jet engine brought about a transformation in the design and function of aircraft. This transformation was paralleled by equally rapid developments in weaponry that saw the gun replaced by the guided missile as an aircraft's main armament.

While the major trend in aircraft development was based on increased speed and armaments, a new development came into being during the 1960s. This was the V/STOL Harrier, a British plane capable of taking off from 'improvised' runways such as roads, or even vertically from small camouflaged clearings. Far more manoeuvrable in the air than more powerful aircraft, the Harrier proved its combat effectiveness during the Falklands conflict of 1982.



War in the streets

On one level modern warfare has involved ever-increasing destructiveness, yet on another there has been a steady increase in the incidence of rioting and crowd violence, often for clear political ends, which has led to armed clashes where casualties are quite light and the weapons less deadly than in conventional warfare. Phalanxes of policemen or troops armed with shields and clubs have taken on groups of rioters hurling bottles and stones. And although these confrontations sometimes seem reminiscent of the battles of the Roman Legions, they constitute one of the typical forms of 20th century conflict.

Riots have a long history as an expression of social discontent, but seldom have they been as common or as varied in cause as in the modern world ranging from student demonstrations in Europe and race riots in the USA in the 1960s to political protests in Poland in the 1980s.

The way governments have responded to this problem has varied according to the seeming danger of the riot and its traditional level of 'tolerance' to such upheavals. In India, for example, where riots seem endemic, riot control is primitive but brutal and casualties are correspondingly high. In the communist world and in South America rioting is seen as a real threat to the authority of the state and repression is swift and massive. In the West, however, rioting is seen as an essentially civil problem, an occasional disorder to be dealt with by the truncheons of the police force rather

Rioters in Japan in 1981.

than with the rifles and bayonets of the army. But the frequency and intensity of rioting in the West since the 1960s has forced the civil authorities to upgrade riot control measures.

A constant factor in the design of riot-control weapons is the need to make them effective in controlling and quelling rioters while, at the same time, ensuring that they are relatively 'harmless'. In view of this dichotomy one such development has been the baton round - commonly known as the rubber or plastic bullet - which has been used by British security forces in Northern Ireland. The two other major weapons used by police and paramilitary forces are CS gas and water cannon, weapons which cause few serious civilian casualties and yet are effective in breaking up concentrations of rioters.

Many other riot-control weapons have been less successful, however, either because they can affect the user as much as the rioter - for example, high-intensity sonic devices or because they run counter to public acceptance, which is the case with the many types of electric shock weapons, whether in the form of simple 'cattle-prods' or as more sophisticated 'tasers', which fire electric contactors on a length of trailing wire to distances of 150m (165 yards) and can temporarily paralyse their victims. But if riots continue to follow a trend of increasing violence, then it seems likely that more extreme measures such as these will be introduced onto city streets.

sources of discrimination; in the area of military doctrine also, as in the now highly elaborated theory of limited war, the controlled use of military power has been raised to a major strategic principle. Clearly, leaders who can command warheads that could destroy whole cities with the explosive equivalent of 10 million tons of TNT, and missiles capable of hitting a single missile-silo at intercontinental range, possess dramatically alternative options as to how they would conduct even the most terrible forms of war.

Whereas warfare earlier in the 20th century had shown an almost automatic tendency to become as destructive as it could, exhausting or destroying those involved, this has not been so since 1945. War is as cruel as ever - but restrictions on escalation are always at work, from President Truman forbidding General MacArthur to attack mainland China in 1950-51 during the Korean War (even though Chinese troops were heavily engaged against the Americans in Korea), to the American decision not to invade North Vietnam during the 1960s. Indeed, Vietnam is a classic example of a great power (the USA) being unable to defeat a much less powerful enemy (the Vietnamese communists) primarily because it dare not apply its overwhelming resources. The war, therefore, was fought on terms that were advantageous to the insurgents. US commanders constantly bemoaned the limits placed on what they could do; but this was the nature of the war.

These limitations have meant that wars have carried on for several years, never surpassing a certain level of intensity, and various of these conflicts may even interlock. The Cold War of the 1940s and 1950s between the Soviet Union and the West might be seen, for example, as a war without a straightforward armed clash, but it provided an extra element in many of the anti-colonial 'hot' wars of the period. The Arab-Israeli Wars and the Iraq-Iran Gulf War came together when Israeli aircraft bombed the Iraqi nuclear reactor in mid-1981, thereby doing themselves a favour while ostensibly helping the Iranians.

Defensive nightmare

This is a very different strategic world from that which theorists foresaw in the months after those two bombs fell on Japan. At that time it was the crudely destructive power of the new weapons that dominated imagination. When a city-busting payload could be delivered by a single aircraft, the task of air defence or limiting the ravages of war seemed hopeless. A few imaginative thinkers concluded that defence was henceforth impossible and that security could only be





found in having the capability to reply to nuclear attackers in kind – that is, in what we would now call nuclear deterrence.

In the early postwar years, however, strategic preparations did not take that form at all. Of necessity, the military preparations of nations like the Soviet Union, which possessed no atomic bombs, had to be confined to conventional forces, though the Russians busied themselves to acquire the new weapons. Until they succeeded, the Soviet Union, like China after it, played down the significance of nuclear weapons and stressed the continued importance of the size of an army, industrial might and military skill. This in turn forced the United States to continue to devote some effort – albeit none too successfully – to preparations for conventional war, even when nuclear weapons were available.

As the wartime alliance broke up and the Cold War began in the late 1940s, the image of future conflict was the familiar one of steady mobilisation and attrition, not the spasm of global destruction we fear



today. Nor was this unreasonable at a time when nuclear weapons, however terrible, were nevertheless only fission bombs compared with today's thermonuclear weapons, when they were scarce and expected to remain so, and when only propellerdriven aircraft existed to deliver them.

The real nuclear strategic revolution occurred in the early 1950s. By that time the Soviet Union had exploded its own atomic bomb, so that a balance of terror, though as yet uneven, existed in fact as well as theory. Moreover, in 1952 both the United States and the Soviet Union tested thermonuclear devices – hydrogen bombs – of which the potential explosive yield was unlimited. Studies initiated by President

The nuclear bomb (below) has revolutionised many aspects of warfare. New weapons like RAF Vulcans (above left) were developed to deliver it, and infantry have had to train to fight on battlefields where tactical nuclear weapons are available (below left). With nuclear stalemate, the Soviet Union has had almost a free hand in eastern Europe (above, Soviet tanks in Budapest, Hungary, in 1956).



Smallarms design

At the end of World War II most foot soldiers were armed with bolt-action magazine rifles like the British SMLE. Such rifles, accurate at ranges above 1000m (1100 yards), had been the infantryman's basic weapon for 50 vears. Since 1945, however, there has been a revolution in smallarms design with the introduction of smaller automatic weapons that attempt to combine both accuracy and firepower. Known as assault rifles, the first such weapons were developed during World War II in Germany, where the lightweight MP44 was produced. This gun was the model for the famous Soviet AK47 which became the standard infantry weapon for many communist armies.

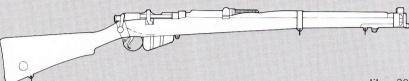
In the West a variety of designs has been produced. The two most common weapons used by Nato forces are the Belgian FN rifle and the US M16. The high-velocity M16 makes widespread use of aluminium and

Individual Weapon (experimental)



Short Magazine Lee Enfield (SMLE) Mk III

calibre 5.56mm length 770mm (30.3in) weight 4.98kg (10.97lb) operation gas feed 30 round magazine mode of fire single shot, automatic muzzle velocity 900m/sec (2953 ft/sec) sight optical (The new breed of smallarms is fully examined in a forthcoming volume)



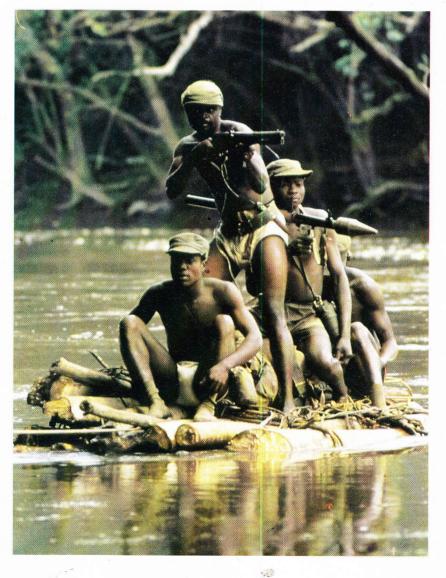
plastic and is notable for having a calibre of 5.56mm. These smaller calibres represent the trend for the future, and the British Army has decided to adopt the 5.56mm Enfield Individual Weapon to replace its version of the FN rifle.

calibre .303in length 1130mm (44.5in) weight 3.91kg (8.62lb) operation bolt feed 10 round detachable box mode of fire single shot muzzle velocity 628m/sec (2060 ft/sec) sight front and back

Harry Truman when the first Soviet nuclear test occurred suggested that, as the nuclear balance became two-way, it would at least partially neutralise American nuclear weapons. And so the conventional forces of the West had to be maintained at a level able to match the striking power of the Soviet Army.

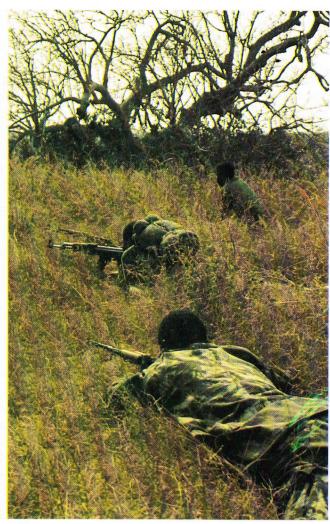
The fears of the West were increased by the Korean War (1950-53), which seemed to prove communist aggressiveness and stimulated a considerable degree of Western rearmament. Korea was a conventional conflict on a large scale in which there were over a million casualties, and in which the masses of the North Korean and Chinese Armies were opposed by the technical expertise of Western forces. And the latter managed eventually to stem the communist tide. But the Korean War proved very frustrating to American public opinion; for if the confinement of the conflict to Korea was an important step towards evolving our modern ideas of 'limited war', it seemed to surrender the initiative to the aggressor, and the conventional military efforts put a heavy economic burden on both the United States and its European allies.

As a result, American strategy under President Dwight D. Eisenhower and Secretary of State John Foster Dulles, who dominated the 1950s, took the opposite course to that which the Truman studies suggested. Instead of playing down nuclear weapons and building up conventional forces, the United States adopted the policy of trying to throw an umbrella of nuclear deterrence over all its security interests. This was the doctrine of so-called Massive Retaliation. The United States broke with its diplomatic tradition and, trying to repeat the achievements of Nato, concluded a great number of alliances - notably the Southeast Asia Treaty Organisation and the Central Treaty Organisation - in an effort to indicate what the umbrella covered. American armed forces and, later, Nato commanders, were authorised









Guerrilla warfare has been the most prevalent form of conflict since 1945, especially in the countries. of the Third World (such as Angola, above right), A ready supply of effective weapons and the nature of the country gave guerrilla fighters (opposite) definite advantages over the Portuguese in Africa. In such operations, sophisticated weaponry like helicopter gunships (above) are often of only limited use compared with adaptable and experienced ground troops (like these South Africans, top), skilled in guerrilla-type tactics.

to count on the use of nuclear weapons, which were put into the hands of both American and allied armies and navies for tactical use.

During the 1950s both American and European expenditure on conventional forces fell sharply. Nevertheless, dependence on nuclear retaliation even for lesser aggressions against American allies gave rise to considerable concern – not least in the United States, where it was argued that such a threat was not credible, leading as it might to Soviet response against American cities, and consequently not an effective deterrent. Such objections came to a head when East-West tensions, which had relaxed after the death of Stalin and the end of the Korean War in 1953. increased again late in the decade. The chief source of political tension was Premier Khrushchev's reopening of the Berlin issue in 1958, accompanied by hints that small-scale Soviet military operations could cut off the city, leaving the weaker Western alliance to find a balanced and effective response.

Outside Europe, the limitations of strategy based primarily on nuclear weapons were demonstrated rather more decisively when consideration was given, in 1954, to using atomic bombs to help the French raise the siege of Dien Bien Phu in Indochina. The option was rejected on grounds of both danger (risking world peace) and probable military ineffectiveness (like taking a revolver to a swarm of bees). There was, it seemed, no substitute for fighting on the ground, and French defeat was soon followed by the prolonged American entanglement in Vietnam.

Nuclear weapons were quite clearly out of place in the wars that spread over much of Africa and Asia in the 1940s and 1950s. World War II had dealt a body blow to the power of the Western European nations that had once parcelled up the world between them, but the process of disengagement was painful and bloody as the Dutch, French, British and Portuguese fought their rearguard colonial actions. These were often accompanied by American efforts to shore up some regimes against revolutionary nationalism.

Guerrilla warfare

The example for the insurgents was in China where, during the 1940s, Mao Tse-tung had won the civil war against Chiang Kai-shek's forces by applying his vision of guerrilla warfare. His precepts were adopted by rebels and revolutionaries around the globe. From the jungles of Indonesia and Malaya to the mountains of the Yemen, and from the paddyfields of Vietnam to the Algerian desert there were cells and conspirators trying to be the revolutionary fish swimming in a sea of people.

Considerable friction arose among the Western powers about the wisdom and skill that the others displayed in these encounters, but all learned the difficulty of resisting guerrilla campaigns conducted by groups inspired by ideological fervour, particularly if they were associated with nationalism. And it was not only nuclear power that proved to be inapplicable to these wars. All the paraphernalia of modern military might could miss the enemy completely.

WAR SINCE 1945

How could armies designed to fight a short, highly technical war cope with the debilitating task of holding down a countryside or an urban area where, at any moment, death could come from a booby trap or an assassin's bullet? How could armies whose basic procedures included isolating armed force from the civilian population deal with opponents who saw the general populace as their most important weapon?

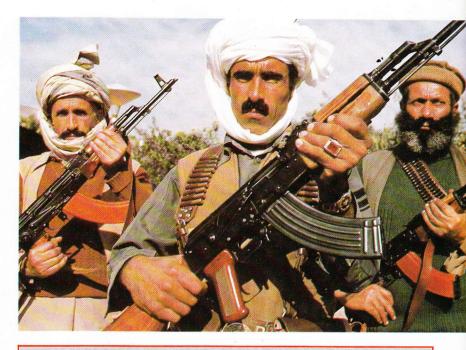
The problems continued right down to the most basic tactical decisions, and are still of enormous importance today. What use is a helicopter gunship against a village in which there are a mere handful of activists out of a population of several hundred? As the Americans found in Vietnam in the 1960s and the Russians are now discovering in Afghanistan, the best-trained tankman in the most up-to-date tank can be as impotent as if he were in a Roman chariot when faced with a dedicated guerrilla army.

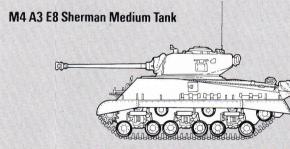
Arms and the man

To compound these difficulties, when a Western army did manage to bring guerrillas to battle on terms it could at least understand, the military task was by no means easy. Whereas in former times the European powers could expect decisive technological superiority, modern weaponry often proved very adaptable to insurgent use. A large quantity of weapons had been dispersed in World War II and much more was made available afterwards from surplus stocks. As the postwar years wore on, it became clear that many of the newer, so-called 'sophisticated' weapons were very useful to relatively simple armed forces. The missile and the shaped charge – which relies on chemical energy in the warhead to penetrate armour rather than the kinetic energy derived from a gun barrel - offered highly portable hitting power, and many of these weapons, complex in themselves, could be supplied pre-packaged, needing no maintenance and even little skill to fire them accurately.

The availability of these weapons to insurgent forces is the most obvious aspect of a major characteristic of the modern military world: the growth of a large international trade in arms. For this there are both economic and political reasons. Modern weapons are immensely expensive, the inflation of military prices having grown much more rapidly than that in the civilian sector. The Chieftain tank is about twice the price of a Centurion, a Jaguar aircraft three times that of a Hunter, and a Tornado or an F-15 costs well over \$20 million. Even a simple anti-tank round of ammunition can cost more than \$5000, while some

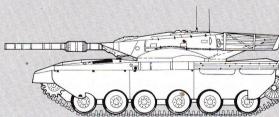






weight 32.3 tonnes (31.8 tons) length 6.27m (20ft 7in) height 3.43m (11ft 3in) armament 1x 76mm gun, 2 x 0.3in machine guns, 1x 0.5in machine gun, 1x 2in smoke mortar ammunition carried AP armour 12-75mm (0.5 – 3in) range 160km (100 miles) speed 42km/h (26mph) crew 5

Merkaya Main Battle Tank



The changing shape of tanks: from Sherman to Merkaya

Few tanks have had such a long career as the American-built M4 Sherman, which first came into use in 1942 and was still in service during the early 1980s.

Upgunned by the Israelis, the Sherman saw combat in the 1956 campaign, the Six-Day War and even the Yom Kippur War of 1973, although during the 1960s a new range of tanks came into service which totally outclassed the Sherman. They included the British Chieftain and the German Leopard I.

weight 55.9 tonnes (55 tons) length 8.63m (28ft 4in) height 2.64m (8ft 8in) armament 1 x 105mm gun, 1x7.62mm machine gun, 2 x light machine guns ammunition carried APDS, HEAT, HESH, APFSDS, Phosphorous armour 105mm (4.13in) range 450km (280 miles) speed 46km/h (28mph) crew 4 (A full profile of the Merkava appears on page 303)

The Arab-Israeli Wars of 1967 and 1973 provided tank designers with many useful lessons and in 1979 the Israeli Merkava main battle tank came into operation. It embodied unusual design features with the engine at the front and the turret and crew compartment at the rear.

Besides its 105mm main armament, the Merkava has standard night vision equipment, a fire control system incorporating a laser rangefinder, and a nuclear, biological and chemical (NBC) warfare system.

The world has been flooded with smallarms like the Soviet AKM (left, in the hands of Afghan mujahideen) but this arms trade has sometimes rebounded on the producers. This expensive Russian helicopter (right) was brought down by those same mujahideen who found Soviet arms so easy to obtain.





The destructive power of modern weaponry was amply demonstrated during the Falklands conflict, when Britain lost several ships to weapons supplied by herself or her European allies - as when the frigate HMS Antelope exploded (above) when a team were trying to defuse a bomb lodged in the engine room. Far left: In spite of the cost of modern shells, during its advance into the Lebanon in 1982 the Israeli Army used lengthy bombardments against urban areas rather than risk its troops in street fighting.

air-to-air missiles can cost over \$1 million each. One consequence is the search for export orders to share the cost of research and development, thereby helping the armed forces in their budgeting battles at home. Like any other exports, military sales overseas help the balance of trade. But many arms exports take the form of gifts – though decreasingly so as more Third World countries acquire the means to pay – because arms can buy influence, although it is often debatable whether donor or recipient acquires the greater leverage. That being so, the supply of arms has become a competitive business between adversaries.

A major milestone in this process occurred in 1955-56 when Nasser's Egypt broke out of a joint US-French-British effort to control the military balance in the Middle East by concluding arms deals, first with Czechoslovakia and then with the Soviet Union itself. As this episode illustrated, the arms

trade is not merely, or even primarily, a matter of suppliers forcing arms on recipients. The recipients believe they have serious security needs to fulfil. Wherever the suppliers have contemplated embargoes, the result has been resentment, a search for alternative suppliers and, ultimately, the appearance of indigenous arms industries in the Third World. By the 1970s Israel, India, Brazil and other countries outside the two main military blocs had become significant arms exporters themselves.

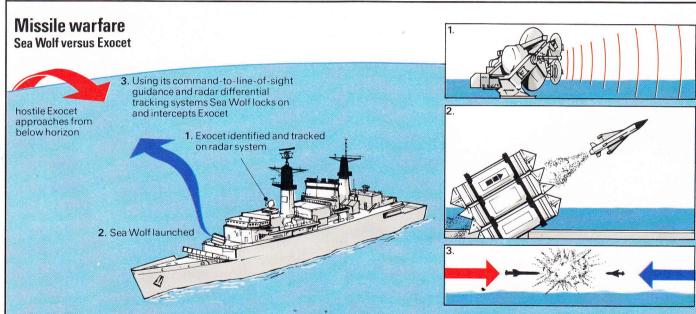
Arms sales and transfers have become very big business indeed, the total of air, ground and naval weapons delivered to Third World countries in the decade 1972-1981 being estimated at a total value of nearly \$160 billion in 1972 prices. The bulk of these shipments has gone to the Middle East and South Asia, where they have found a ready use.

Whereas the 'first generation' of wars in the Third



World were generally to secure national liberation, there has since been a 'second generation' of struggles between the newly independent nations. These struggles have involved all aspects of conventional warfare. In the Middle East, for example, the Arab-Israeli wars have been on a massive scale, and have served as a testbed for much Western and Soviet military doctrine as well as for modern weapons. Since it became independent in 1948, Israel has been in continual conflict with its neighbours; the wars have ranged from the intense street fighting of 1948-49 to the World War II-style blitzkriegs of 1956 and 1967, when the precepts of mobile offensive warfare were brilliantly applied across the young state's borders.

The Arab-Israeli War of October 1973 raised – and only partly answered – important questions about the role of modern weapons in creating strategic and tactical surprise and whether the new precision guided munitions favoured the offence or the defence. Arab use of wire-guided missiles and new Soviet anti-aircraft systems seemed to have eroded some of the advantages that Israeli forces had previously enjoyed; but then in 1982 during the invasion



The guided missile is arguably the most revolutionary weapon to have been developed since 1945. Although missiles had been used by the Chinese in the 13th century in the form of gunpowder-propelled rockets, they did not come into their own until the invention of advanced and miniaturised electronic guidance systems. Today the guided missile is generally acknowledged as the most fearsome weapon on the battlefield.

Such weapons are very expensive to produce and are primarily designed to knock out machines or other large objects rather than individual soldiers. Thus missiles have come to play a central role in the aerial and naval confrontations of maritime warfare.

The Falklands conflict highlighted the complexity and effectiveness of this form of warfare. The Argentine forces made good use of the French-built Exocet missile, which is capable of being launched from land, sea or air and has a range of over 40km (25 miles). It possesses an ingenious two-stage guidance system. The first, operated from the launching vehicle, directs the missile in the general direction of the target, while the second, inside the missile itself, comes into operation when the missile is a few kilometres from the target, so permitting final adjustments as it homes in on the

target vessel at near supersonic speeds. The effect of such a weapon can be devastating, as shown when HMS *Sheffield* sank after being hit by one Exocet.

There are, however, a number of ways of countering these types of missiles, either by attempting to jam the electronic system within the missile (electronic countermeasures) or by attempting to shoot the missile down in flight. Although the tremendous speed of the Exocet, which skims towards its target at very low level, would seem to rule out the idea of shooting it out of the sky, the British Sea Wolf missile is capable of doing just that. The range of the Sea Wolf is relatively limited but, given the right circumstances, its advanced 'command' electronics allow it to hunt down and destroy the Exocet while in flight. In this role the Sea Wolf thus becomes an anti-missile missile.

The revolutionary nature of these weapons derives from the fact that they fight each other virtually independently of their crews. Sea Wolf versus Exocet is, fundamentally, a contest between electronic guidance systems – an aspect of modern war in which the sailor or soldier may be killed, but in which he can hardly influence the course of the contest.

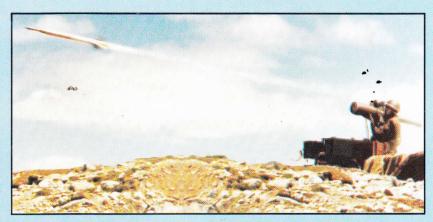
of the Lebanon, the almost surgical precision with which the Syrian forces (and particularly their antiaircraft missile systems) were neutralised provided overwhelming evidence to the contrary.

Elsewhere, too, wars between newly independent states have been on a large scale, as-in the case of the struggle in the Horn of Africa between Ethiopia and Somalia (1977-78) and the still continuing Gulf War between Iran and Iraq. Where competing national interests are concerned, war seems to have become more rather than less likely in the last two decades, and with the widespread availability of sophisticated weaponry, radical changes in the world's political geography can be affected – as in 1971 when the state of Bangladesh (with a population of 75 million) came into being through an Indian invasion of East Pakistan that owed much to the provision of Soviet rivercrossing equipment to the Indian Army.

Despite the significant differences of terrain and climate between Europe and much of the Third World, these wars afforded much food for thought within the two military blocs that face each other in Europe. Here the question of the relation of nuclear to conventional weapons still persists. It could be argued that it is in the conventional area that the pace of technological development has been most impressive. Indeed, much of the technology in 'nuclear weapons' – the guidance, fusing, accuracy and propulsion – is common to conventional weapons as well. Modern materials, explosives and fuels have all contributed to this technical revolution, but most important has been the micro-computer.

Precision guidance

This is the chief source of precision guidance, for sensors and computers enable weapons to use information received after launch, permitting them to correct course and thereby achieve the accuracy often summed up as 'if you can see it, you can hit it'. Great advances in surveillance and communication have also increased the ability to 'see'. For that reason interference with the ability to see becomes a major military objective, so that electronic countermeasures (ECM) and counter-countermeasures (ECCM) become a succession of competitive manoeuvres. Rapid advances and counter-advances in electronics are thus not only a feature of the peacetime competition but can continue into wars and even into particular engagements, as the combatants adapt to the enemy's tactics and equipment.





It is often argued that the latest precision-guided missiles favour the defence, because cheaper missiles can destroy expensive aircraft and tanks as the latter make themselves conspicuous by movement in attack. This is, however, a gross oversimplification. The aggressor, or even the attacker in a particular battle, is not always on the move; he may have seized territory and gone on the defensive. And although anti-tank and anti-aircraft missiles are cheaper than tanks or aircraft, they are not cheap in absolute terms. Moreover, because the attack can concentrate, the defender needs considerable numbers of defensive weapons to cover his front. If the weapons are to be

New weapons and electronics have altered the battlefield. Hand-held missile launchers like the Shorts Blowpipe (top) give infantry a new punch, while (opposite) tanks are now seriously threatened by missile-carrying helicopters (above). And precise overall surveillance becomes possible using AEW planes like the Grumman Hawkeye (below).



Styles of command

One of the main themes in the story of warfare since 1945 has been the amazing strides made in weapon technology; its influence has been such, however, that it has obscured one of the most enduring factors in war – leadership. Whether at the level of section leader or army commander, the ability to motivate men to perform unpleasant and often dangerous tasks is the essence of military leadership and is, perhaps, the single most important element in securing victory on the battlefield. Confidence in its commander is the most important advantage an armed force can possess.

Since 1945 the style and type of leadership displayed by military commanders has been as diverse as ever, ranging from battlefield soldiers like Moshe Dayan, through ideological leaders such as Mao

Tse-tung to the modern technocrats represented by Alexander Haig and Sandy Woodward.

These men all embodied the traditional virtues of leadership. They saw clearly what type of war they were fighting; they realised what their forces were capable of, and they worked out how to achieve their desired aim. Their solutions to the problems they were posed often involved what seemed to be great risks; but they were all proved perfectly adapted to the situation. Dayan's bold strike across the Sinai in 1956; Mao's decision to build his revolution on the peasantry rather than on the urban proletariat; and Woodward's defence of his aircraft carriers against the land-based Argentinian Air Force were all the basis of victory.

Moshe Dayan

Few modern soldiers have exemplified the concept of 'leading from the front' as well as Moshe Dayan, but in addition to being a dashing battlefield commander Dayan matured into an outstanding strategic and military planner.

Born on 20 May 1915 on an agricultural settlement in Palestine, Dayan was involved in the Jewish resistance movement from the outset and was an early member of the



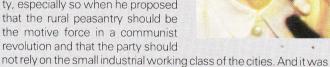
underground defence force, the Haganah.

During the 1948 war for Israeli independence Dayan was made commander of the 89th Commando Battalion which he moulded into a crack fighting force that acted as a mobile reserve able to cover trouble spots in the Israeli lines and to mount attacks against Arab strongpoints. Dayan's abilities as a battlefield commander came to the fore again during the campaign for Sinai in 1956 which he both planned and led: he flung his mechanised columns across the desert terrain of the Sinai, overwhelming the stunned Egyptians unused to such a mobile form of warfare.

Although Dayan went on to become a highly successful minister of defence—responsible for the direction of the Six-Day War in 1967—he proved himself best as a gung-ho 'cavalry' commander in the tradition of such soldiers as Rommel and Patton. He died in 1981.

Mao Tse-tung

Born into a prosperous peasant family in Hunan province in 1893, Mao Tse-tung fell under the sway of Marxism while working as a librarian at Peking University and became a founder member of the Chinese Communist Party. Mao emerged as a controversial figure within the party, especially so when he proposed that the rural peasantry should be the motive force in a communist revolution and that the party should



not rely on the small industrial working class of the cities. And it was as a theorist of revolutionary warfare that Mao proved to be arguably

the most influential military thinker of the modern age.

Realising that the communists could not defeat the opposing Nationalist forces in immediate open conflict, he developed a three-stage plan of revolution that utilised the passive strengths of the peasantry. In the first stage the revolutionaries would be strategically weak but would concentrate on building up 'safe base areas', while during the second stage, using traditional guerrilla warfare techniques, they would wear down the enemy by harassing his forces and spreading out his army. The final stage was termed the strategic counter-offensive, when the revolutionaries would escalate their scale of operation towards mobile conventional warfare that would overthrow a weakened enemy. This three-stage struggle formed the basis for Mao's seizure of power in China as well as inspiring fellow left-wing revolutionaries such as Ho Chi Minh in Vietnam and Fidel Castro in Cuba. Mao died in 1976 but his military legacy lives on to the present day.

Sandy Woodward

Born in Cornwall in 1932, J. F. 'Sandy' Woodward was destined early on for a naval career; after graduating from the Royal Navy College at Dartmouth he went into the submarine branch where he assumed his first independent command, the submarine HMS *Tireless*, at the age of 29

One of a new generation of naval officers, Woodward was brought up to consider nuclear engineering and

computer systems to be as much a part of naval life as good seamanship. When captain of HMS Sheffield – to be sunk in the Falklands conflict years later – he played an important part in the



installation and testing of the Sea Dart missile system. Besides his interest in the development of naval technology, Woodward proved himself an able administrator and naval planner. He assumed the position of Director of Naval Plans in 1978 where his chief function was to present the Navy's case for governmental funds. This is a crucial task in the British democratic system, and involves a clear grasp of strategic priorities and technical possibilities.

Woodward's real claim to fame came, of course, in 1982 when he was appointed commander of the British Task Force to retake the Falkland Islands from Argentina. The problem of logistics alone made Woodward's task a daunting prospect, and this was compounded by the limited number of vessels and aircraft at his disposal. But by sound planning and the careful husbanding of resources Woodward was able to carry out his prime function of putting the land forces ashore and keeping them supplied with food and ammunition until they were able to defeat the Argentinians. After his success in the South Atlantic, Woodward was knighted.



mobile, or proof against attacks or ECM, the price rises correspondingly. That a modern armed force needs such weapons is undeniable and it is clear that they have radically altered certain sectors of the modern land battlefield.

But although these enormous technical advances might seem to take warfare into a new dimension, they still have to be combined with the two variables that have always dominated military activity: leadership, and the quality of the troops involved. The ultimate British victory in the Falklands was the result as much of the superior abilities of the British ground troops as of British achievements in the 'electronic war'; and the Israeli successes in the Middle East since 1948 can be largely accounted for by the expertise and morale of the men of the Israeli Army and Air Force. The Israeli soldier has always been professionally superior to his Arab opponent. This continuing importance of the individual has been carried through to the highest levels of command.

Yet the central paradox remains; these conventional considerations of resolute leadership and well trained troops operate under the threat of a nuclear holocaust

that would nullify any individual abilities and wipe out much of mankind. The complications of this relationship led to considerable scepticism about Nato's very nuclear-dependent strategy by the late 1950s, and in the following decade the Kennedy-Johnson administration, chiefly inspired by Secretary of Defense Robert McNamara, set about reversing this emphasis. In doing so, however, it became impaled on the nuclear-conventional dilemma that runs through all postwar Western strategy.

Hitherto, at the 'strategic nuclear' or intercontinental level, the overall American plan – the Single Integrated Operational Plan, or SIOP – had embraced three categories of target: Soviet (and Chinese) nuclear forces, military targets (especially logistics) and 'urban-industrial' targets. The last category had top priority.

The balance of terror

As intercontinental ballistic missiles (ICBMs) developed in the 1950s and became potentially more accurate, new possibilities emerged. On the one hand you might be able to hit the enemy's nuclear forces and disarm him. But he might do that to yours and so the necessary level of forces would cease to be, as had seemed possible, measured simply by the number of urban targets; the matching of 'orders of battle' familiar in traditional military balances might reassert itself. Thus, while a simple 'balance of terror' offered a chance of levelling strategic forces off at low levels, the creation of a counterforce, though it might buy you relative immunity if successful, also held out the possibility of an arms race.

It was obviously necessary to safeguard the forces for retaliation if cities were attacked and first the United States and then the Soviet Union deployed hopefully invulnerable weapons like the Minuteman ICBM in a silo and the Polaris submarine-launched ballistic missile. This, however, meant that to execute a counterforce strike was more difficult. Accordingly the United States, after flirting with the idea of a 'damage-limiting' strategy employing counterforce, ballistic missile defence and civil defence against fallout, reverted, in the interest of stabilising the balance, to a strategy of 'assured destruction'. It



Despite spectacular advances in the technology of war since 1945, the human element is of overriding importance in guerrilla operations. Above: Child soldier in newly independent Angola, 1975. Above left: A captured Viet Cong receives strong-arm treatment from a member of the US 1st Cavalry in South Vietnam. Below: In the uplands of Afghanistan, mujahideen guerrillas ambush Soviet



WAR SINCE 1945 During the Israeli advance into Beirut in 1982, the full weight of modern military might was on display. The city suffered heavily as it was bombarded (right) and many of its inhabitants were killed or made homeless (inset top). The main damage was done by heavy artillery (inset left, 155 mm self-propelled howitzers in action). Inset below left: An Israeli radio operator. radio operator.

WAR SINCE 1945

hoped the Soviet Union would follow suit.

There did follow a sharp fall in American spending on nuclear weapons but the strategy ran into two great difficulties. In the first place, the Soviet Union, which had launched a great rearmament effort after its humiliation in the 1962 Cuban missile crisis, showed no sign of accepting vulnerability to American strikes if it could be avoided. The threat of a race it could not afford as the United States began programmes for multiple warheads and cruise missiles, prompted the Soviet Union to accept the Strategic Arms Limitation Treaties (SALT) of 1972 and 1979, but these served largely to shift spending into other, as yet unprohibited, areas of strategic weapons.

The second great difficulty with an American strategy of deterrence using the threat of the 'assured destruction' of Soviet cities was that it immediately reopened the problem of how to match the Soviet conventional forces that might threaten America's allies, particularly in Europe. Initially the Kennedy administration approached this problem by asserting that the supposed superiority of the Soviet Army had been exaggerated, that the superior weapons and training of Nato forces made the balance much less uneven, particularly as an aggressor supposedly needs a 3:1 margin of superiority, and that a little more effort would provide, if not a completely adequate conventional defence, at least one to make the Soviet Union uncertain of success. The residual risk that nuclear weapons would be used in what would then be a large and prolonged war might also become rather more credible.

France under General de Gaulle rejected this notion and, having developed its own nuclear weapons, left the integrated Nato command (though not the alliance) in 1966. This paved the way for Nato to adopt a new conventional emphasis – the so-called 'flexible response', still Nato's official strategy. The three stages of this strategy are: (1) direct (conventional) defence, (2) 'deliberate escalation', including the limited use of tactical nuclear weapons in ways never fully, publicly agreed, and (3) general nuclear response.

Flexible response is thus still an ultimately nuclear strategy, and was adopted when Nato still possessed numerical superiority in nuclear weapons and a virtual monopoly of the so-called 'battlefield nuclear weapons'. These, it was thought, could be used to offset inferiority in firepower as well as making a clear step upwards on the ladder of escalation – a step that would deter because of the general terribleness of all-out nuclear war.

Submarines have assumed a new strategic importance since the days of World War II. HMS Superb (below) is a Royal Navy Swiftsure class nuclear-powered submarine commissioned in the late 1970s.

Since 1967 the Soviet Union has systematically eroded the basis of this strategy. Firstly, it has reached virtual parity at the 'strategic' level of weapons. It has also provided itself with a full range of tactical or theatre nuclear weapons, of which the SS-20 mobile multiple-headed nuclear missile of some 2000km (1250 mile) range, is only the most notorious. It is thus now far from clear that it would even be to Nato's military advantage to implement the escalation of flexible response, quite apart from the dire consequences possible for Europe.

Budgets and schedules

It has therefore become even more important to consider the conventional balance. Unfortunately for Nato, that also deteriorated after flexible response was formally introduced in 1967. Admittedly Nato forces improved greatly, especially in readiness. A series of exhortations produced some increase in Europe's efforts and the United States began rearming itself after the 'wasted years' of Vietnam. The Long Term Defence Plan, adopted in 1979, called for an increase of 3 per cent per annum in defence spending in real terms and identified 10 areas for specific improvement. But with the cost of weapons rising rapidly, resources are quickly consumed, and in 1982 the Nato supreme commander declared that the task of conventional defence was manageable only if spending could rise by 4 per cent annually.

The trouble is, of course, Nato's second problem: the immense improvement in Soviet and Warsaw Pact forces. From 1965 to 1980 the two blocs added some 35,000 major new ground weapons on the Central Front, chiefly tanks and armoured fighting vehicles (50 per cent), artillery, rocket launchers and anti-aircraft systems. Of these, 80 per cent were added by the Warsaw Pact, of which more than half were Soviet; of Nato's 20 per cent, less than half were American. Large increases in aircraft produce a ratio of 5:1 in favour of the eastern bloc.

The traditional reassurance for Nato was the superior quality of its weapons, but this is now not so clear cut. Assessments vary, but it would seem that in the main categories Soviet weapons have caught up with or even surpassed those of the West. That Soviet weapons are relatively much better than they were, and are well adapted to the Soviet Union's strategy of rapid penetration, seems undeniable. Particularly worrying for Nato, still very much dependent on warning, mobilisation and reinforcement, is the stiffening of the forces the Soviet Union has deployed forward in peace time and the number and quality of



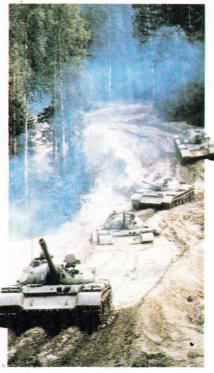
such tools as ground attack aircraft, armed helicopters and airborne forces that could attack at short notice.

The best answer Nato has thought of for the 1980s is to train and equip its forces to use modern target acquisition and conventional precision guided or 'area' weapons – clusters of anti-tank bomblets and the like – to upset the tight time schedule that the Soviet strategy of attacking in 'echelons' requires. Certainly the Soviet Army is much obsessed with the time-scale of action and with having the correct 'norms' of force for each stage. A plausible ability to disrupt this plan by conventional means should thus be an effective deterrent.

It is this conventional confrontation, a direct result of the nuclear stalemate, that has done most to create the mass of destructive new weapons that are actually used in the wars of the Third World. The European conventional balance also has implications for the nuclear balance that are extremely disturbing.

It was always clear that Nato needed nuclear weapons if only to deter Soviet first use; for Soviet strategic writings gave the impression the Soviet Army itself would initiate the use of nuclear weapons if war broke out. It was for this reason that Nato maintained and refurbished its theatre nuclear arsenal - while reducing the numbers - and began to include some, such as the Cruise missile, that could deprive Soviet territory of immunity in a European nuclear war. In 1974 under Secretary of Defense James Schlesinger, the United States also tried to adapt its strategic policy for long-range nuclear weapons so that it could attack limited targets in the Soviet Union in retaliation for nuclear attacks on allies, without doing such damage as to leave the Soviet Union no reason for restraint in its response. Targets might be





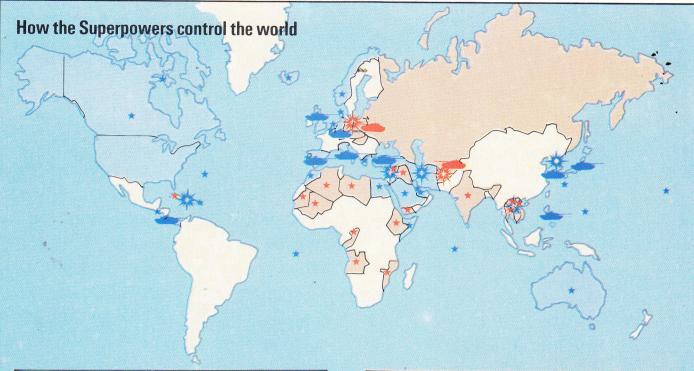


neither cities, nor nuclear bases, but perhaps a limited set of other military targets, possibly directly related to the supply of a Soviet invasion of Europe. That such thoughts are possible is due to the accuracy of modern weapons and the improved capabilities for command and control. Indeed with accuracies of 30m (35 yards), it may be possible to destroy so-called strategic targets with *conventional* warheads.

Clearly these developments have ambiguous implications. By making nuclear war seem more 'manageable', the new strategic doctrines may enhance deterrence of any war at all; but equally, if deterrence nevertheless failed, the same doctrines and techniques could obviously hasten the combatants across the nuclear threshold and onto the ladder of escalation.

The horrible prospect of a devastated world has given renewed impetus to the idea of disarmament and arms control in the postwar era. In the 1960s and 1970s some significant agreements were achieved; perhaps most remarkable was the conception of 'arms

Confrontation between the two superpowers takes many forms Intercontinental ballistic missiles such as America's Minuteman (top left) form the basis of nuclear deterrence. In Europe the forces of Nato and the Warsaw Pact remain alert for quick deployment. The might of Soviet armour (above left) is a constant worry to Western defence planners, and training for the nuclear battlefield continues apace (top right). To counter increasing Soviet presence at sea, the United States has recently given added priority to its naval strength (above).





COUNTRIES WITH LARGE SCALE US MILITARY

West Germany, West Berlin (Nato), United Kingdom (Nato), Italy (Nato), Turkey (Nato), Spain, South Korea, Philippines, Japan, Panama



COUNTRIES WITH MINOR US MILITARY FORCES, MILITARY ADVISERS, AIR FORCE AND NAVAL FACILITIES

Holland (Nato), Belgium (Nato), Denmark (Nato), Norway (Nato), Greece (Nato), Portugal (Nato), Iceland (Nato), Canada (Nato), Bermuda, Puerto Rico, El Salvador, Cuba (Guantanamo), Morocco, Egypt, Somalia, Saudi Arabia, Oman, Bahrain, Okinawa, Midway, Guam, Australia, Ascension Island, Diego Garcia



COUNTRIES SUBJECT TO US MILITARY INTERVENTION

Korea 1950 - 53, Vietnam 1954 - 73, Lebanon 1958, Cuba 1961, San Domingo 1965, Cambodia 1970, Laos 1970, Iran 1980



COUNTRIES WITH LARGE SCALE SOVIET MILITARY PRESENCE

Poland (Warsaw Pact), Czechoslovakia (Warsaw Pact), Hungary (Warsaw Pact), East Germany (Warsaw Pact), Afghanistan



COUNTRIES WITH MINOR SOVIET MILITARY FORCES, MILITARY ADVISERS, AIR FORCE AND NAVAL FACILITIES

Cuba, Algeria, Mali, Mauritania, Ethiopia, Congo, Angola, Libya, Mozambique, North Yemen, South Yemen, Iraq, Syria, India, Laos, Kampuchea, Vietnam



COUNTRIES SUBJECT TO SOVIET MILITARY INTERVENTION

East Germany 1953, Hungary 1956, Poland 1956, Czechoslovakia 1968, Afghanistan 1979 –

World War II brought about a transformation in the world's power system: the major European states which had, until then, played a leading role in world affairs were supplanted by the emergence of the United States and the Soviet Union as two competing superpowers. Not only were the United States and the Soviet Union so much more powerful than other nations; more significantly they were able to establish spheres of influence throughout the world which "ensured that few nations could remain outside the two armed camps of East and West. All warfare since 1945 has taken place in the shadow of this rivalry and has had, at the very least, to take account of it.

Both the United States and the Soviet Union have set up formal military organisations in opposition to each other. In Europe this is clearly brought into focus, with the Nato alliance of the West set against the Warsaw Pact of the East. But over the rest of the world also, groups of nations have been allied to the United States in organisations like Seato and Cento, while the Soviet Union has signed treaties of friendship and co-operation with various states.

Superpower influence extends to areas in less formal ways: the United States is very influential in South-America, for example, while the Soviet Union supports regimes in the Middle East and Africa. Tension between the two superpowers arises when one believes

that the other is overstepping the boundaries of its influence. Thus the United States is concerned about developments in Central America, where left-wing guerrilla forces are considered to be in league with the Soviet Union and its 'client state' Cuba, in attempts to undermine the dominance of the United States in that region. Both powers are prepared to help their own clients or allied governments when these require it – which led to American involvement in Vietnam and Soviet intervention in Afghanistan – and they are the main sources for the armaments that fuel the wars of the Third World.

Although the influence of the superpowers is far from total – China, possibly a third superpower of the future, is no friend of the Soviet Union, and in the West, relations between the European states of Nato and the United States are becoming increasingly fraught – the extent of their control shows no signs of diminishing. Indeed, in many ways their influence is expanding, an example being the way in which the Soviet Union has, since 1965, built up a navy that has given it a much greater capacity for global intervention than it possessed in the 1950s. In reply, the USA's rapid deployment force is designed to buttress US power in the unstable areas of the Middle East; and so the escalation of confrontation continues, over the entire world.



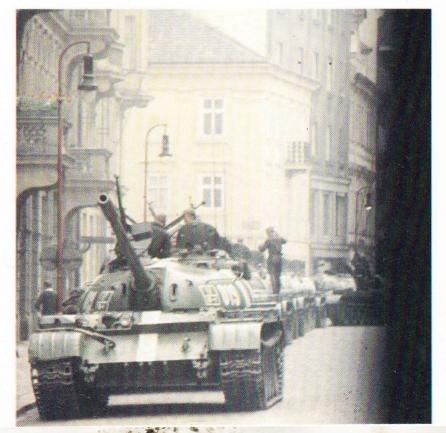
Superpower intervention at moments of acute tension. Above: US forces fly into Beirut in 1982 after Israel's sweep into the Lebanon. Below: Soviet T55s patrol the streets of Prague in 1968, crushing the Czechs' attempts at liberal reform.

control' itself, conveying the idea that it is more important to control the use and political effect of weapons than merely to reduce their number. But disarmament and arms control still suffer from the familiar problems of agreeing a fair balance, verifying compliance with agreements, and preventing the mere diversion of resources from one form of military power to another. Difficult though SALT has proved, the efforts to negotiate control of arms in Europe through the Mutual and Balanced Force Reduction

talks in Vienna since 1973 have illustrated the even greater complexities of regulating conventional forces.

The 1970s also suggested that it would be premature to concentrate on disarmament in Europe to the neglect of the wider world. As we have seen, war continued briskly among the new states of Afro-Asia, much of it internal. With the international arms trade providing a ready supply of weapons, and mercenary forces providing ready-made trained troops, Africa in particular was the scene for long drawn-out wars. But in the 1970s the Soviet Union's greatly expanded and improved naval and airborne forces demonstrated their capacity to operate overseas, while the use of the Cubans in Africa opened up other novel possibilities. Such proxies, naval demonstrations, arms supplies, and training missions illustrated how much military power can do to provide underpinning for a more decisive conflict. In Angola, for example, Cuban troops rapidly achieved a victory for the communist MPLA in 1975. In response to Soviet policy the United States reactivated concern for its 'power projection forces', reversing the contraction of its navy, ordering more aircraft carriers, organising a task force for rapid deployment, and seeking additional military facilities in the Indian Ocean to refurbish the West's depleted network of bases.

Meanwhile the extension of Soviet-US rivalry in conventional forces to all areas of the globe was accompanied by another, possibly more ominous, development. The military power of the Third World itself was growing in size and sophistication and began to acquire capabilities previously possessed only by the Western and communist blocs. India's detonation of a nuclear device in 1974, the widely suspected Israeli possession of nuclear weapons, and the nuclear development programmes of such coun-





tries as Pakistan and Brazil raised fears of an increasing pace to what had hitherto been a rather slow rate of nuclear proliferation. It is now by no means impossible that nuclear weapons will first be used in anger not in Europe but in the Third World, the battleground of rival ideologies for over 30 years.

At the same time rivalry between the two superpowers has moved into the field of high technology and space. Enormous sums are being invested in the development of a 'third generation' of weapons making possible the more selective use of nuclear explosions. For example, scientists today foresee a weapon that could create a large magnetic pulse to destroy an opponent's communications system, and an X-ray laser capable of destroying enemy missiles. Even larger sums have been invested in the task of carrying war into outer space. Both the United States and the Soviet Union are rapidly expanding their military operations in space for communications, intelli-

gence-gathering, weather forecasting and mapping. Space is already an active theatre of operations.

The world is still in the uneasy age that began in 1945, and, although nuclear weapons have not been used since then, there are no signs that war is to be abandoned as an instrument of national policy. While the urge to limit and control military power, if not to abolish it altogether, is probably more widespread and more clearly articulated by political leaders and ordinary people alike than at any previous time in history, there is no guarantee of moderation in practice, and it remains to be seen whether the zone of stability, if not of true peace, established between the major blocs of developed nations can be extended to the Third World. Just as modern weapons simultaneously offer an unprecedented capacity for both destruction and discrimination, so the wider strategic scene embodies a potential for both control and catastrophe. **Professor Laurence Martin** Israeli M48s and Centurions crossing a ridge in the Sinai in 1967. Tanks like the Centurion regularly proved their ability to be updated and were a match for their Soviet-built counterparts for 30 years.

Key Weapons The

The TORNADO







The Tornado variable-geometry, all-weather Nato combat aircraft is produced by Panavia Aircraft GmbH, a tri-national company set up jointly by Aeritalia of Italy, British Aerospace in the UK and Messerschmitt-Bölkow-Blohm of Germany. The first prototype of the Tornado flew in August 1974, to be followed by eight more prototypes and six preseries aircraft. Each country manufactures major components: the UK, front and rear fuselages; Germany, centre fuselages; and Italy, the wings. And each country assembles the aircraft for its own armed services.

The first batch of production Tornados consisted of two variants: the IDS (interdictor strike variant) and the ADV (air defence variant). Of the IDS variants, 212 aircraft were produced for the German Air Force, 112 for the German Navy, 100 for the Italian Air Force and 220 for the RAF; the 165 ADV aircraft were built solely for the RAF. The Tornado is intended to perform six major roles: battlefield interdiction; interdiction/counter air strikes; air superiority; naval

attack; interception/air defence; reconnaissance.

The Tornado is powered by two RB 199-34R afterburning turbofan engines, each delivering some 6800kg (15,000lbs) thrust, which provide a maximum level speed of Mach 2.2 at high altitude. This versatile engine also allows the Tornado to become airborne using short dispersed airfields; and with wings swept forward the Tornado can take off from strips of no more than 900m (2950ft) in length, in all weathers, day and night. For high-speed flight — at both high and low altitudes—the wings are fully swept back. Carrying a heavy weapons load the Tornado has a tactical radius of around 1400km (870 miles).

The advances in defensive weaponry, such as radar-laid anti-aircraft artillery and surface-to-air missiles, have greatly complicated the task of an advanced attack aircraft. In order to increase the chances of survival in this environment, the Tornado is designed to penetrate enemy defences at night or in bad weather at heights of 60m(200ft) at high speed. In visual conditions the aircraft can be flown even lower.

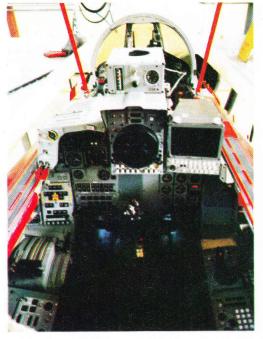
Previous page: Two prototypes bank over the English countryside on a test flight. Top: The Panavia Tornado 03 prototype armed with Kormoran anti-shipping missiles. Above: A Tornado 03 takes-off from Warton airfield. Suspended from the wings are two 1500 litre fuel tanks (with red tips) and the new Ajax ECM pods. Above right: A Tornado on a test flight in its role as a trainer aircraft. Right: The ADV prototype takes-off for a demonstration flight at the 1980 Farnborough Air Show

TORNADO





KEY WEAPONS

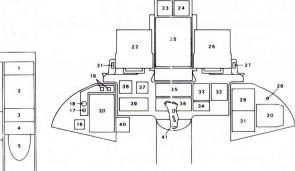








The complexity of the Tornado is demonstrated in these views of the cockpit interior, including that of the rear cockpit on the trainer model (top).
Above right: Four pictures of ground-crew preparing a German Tornado for take-off. Below: Diagram of the navigator's controls.
(NB: Numbers referred as 'blank' indicate spaces left on the control panels to incorporate future developments.)



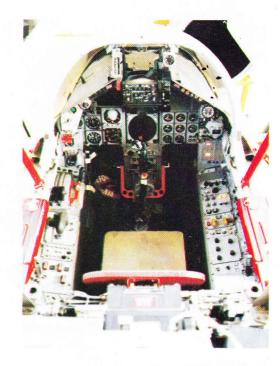
1 BLANK
2 MAPPING RADAR CONTROL PANEL
3 HEAD DOWN DISPLAY RECORDER (HDDR) CONTROL PANEL
4 BLANK
5 MAP-STOWAGE
6 WANDER LAMP
7 RI ANK
7 RI ANK

6 WANDER LAMP
7 BLANK
8 OXYGEN CONNECTION PANEL
9 OXYGEN SUPPLY PANEL
10 BLANK
11 BLANK
12 BLANK
13 CANOPY JACK RELEASE HANDLE
14 INTERNAL CANOPY JETTISON HANDLE

15 ATTACK RELEASE SWITCH
18 LANDING GEAR POSITION INDICATOR
17 OXYGEN TEST BUTTON
18 ©XYGEN CONTENTS INDICATOR
19 OXYGEN FLOW INDICATORS
20 WEAPON CONTROL PANEL 1
21 ATTENTION GETTER
22 LEFT TYVTAB DISPLAY
23 ALTIMETER
24 COMBINED SPEED INDICATOR
25 COMBINED SPEED INDICATOR
25 COMBINED ADDAR AND PROJECTED MAP DISPLAY (CRPMD)
26 RIGHT TV/TAB DISPLAY
27 ATTENTION GETTER
28 BLANK
29 ACCIDENT DATA RECORDER (ADR) FAIL LIGHT
30 CENTRAL WARNING PANEL (CWP)
31 BLANK
33 BLANK
33 BLANK
35 NAVIGATION MODE CONTROL PANEL
36 WEAPON AIMING MODE SELECTOR (WAMS)
37 ARTIFICIAL HORIZON
38 BLANK
40 CLOCK
41 NAVIGATOR'S HANDCONTROLLER
42 COCKPIT VOICE RECORDER (CVR) CONTROL PANEL
43 MAIN COMPUTER IMC) CONTROL PANEL
44 INERTIAL NAVIGATOR (INI) CONTROL PANEL
45 SECONDARY ATTITUDE AND HEADING REFERENCE (SAHR)
46 INTERNAL LIGHTS PANEL
47 BLANK
48 BLANK
48 BLANK
59 BLANK
50 BLANK
51 BLANK
52 VUHF CONTROL PANEL
54 COMMUNICATION CONTROL SYSTEM (CCS) CONTROL PANEL
55 MISCELLANEOUS SWITCH PANEL
56 MICRO-DETONATING CORD (IMCC) SAFETY PIN STOWAGE
57 SEAT SAFETY PIN STOWAGE
58 SCOM MAND EJECTION SELECTION LEVER
59 SEAT LOWER/RAISE SWITCH
60 LAMPS TEST PANEL







Above: A view of the pilot's cockpit on the final assembly line at the MBB works in Germany. The sheer complexity of the instrumentation makes flying modern aircraft such as the Tornado a daunting prospect. Below: Diagram of the pilot's controls.

- 1 ENGINE START PANEL

- 1 ENGINE START PANEL
 2 WING SWEEP LEVER
 3 THROTTLES
 4 MANDEUVRE AND AIRBRAKES SWITCH
 5 PILOT'S HANDCONTROLLER
 6 COMMUNICATION CONTROL SYSTEM (CCS) CONTROL PANEL 7 BOMB RELEASE SAFETY LOCK (BRSL) CONTROL PANEL
- 8 BLANK
- 8 BLANK
 9 WANDER LAMP
 10 OXYGEN CONNECTION PANEL
 11 OXYGEN SUPPLY PANEL
 12 BLANK
 13 CRASH PANEL

- 12 BLANK
 13 CRASH PANEL
 14 VJUHF CONTROL PANEL
 15 COMMAND AND STABILLITY AUGMENTATION SYSTEM (CSAS) CONTROL PANEL
 16 AUTOPILOT AND FLIGHT DIRECTOR (AFDS) CONTROL PANEL
 17 CANOPY JACK RELEASE HANDLE
 18 INTERNAL CANOPY JETTISON HANDLE
 19 EMERGENCY FLAP SWITCH
 20 EMERGENCY AIRBRAKE SWITCH
 21 FLAPS LEVER
 22 ANTI DAZZIE LIGHTS SWITCH
 23 TAXI THRUST SELECTOR
 24 L.P. COCKS SELECTOR SWITCHES
 25 LIFT DUMP INDICATOR
 26 REVERSE THRUST INDICATORS AND OVERRIDE SWITCH
 27 ARRESTER HOOK PUSH BUTTON AND INDICATOR
 28 MASTER ARMAMENT SAFETY SWITCH
 29 PILOT'S WEAPON AIMING MODE SELECTOR (WAMS) SWITCHES
 30 PILOT'S WEAPON AIMING MODE SELECTOR (WAMS) SWITCHES
 11 ATTENTION GETTER
 21 LATE ARM SWITCH
 33 ANGLE OF AITLACK (AOA) INDICATOR
 34 ACCELLEROMETER
 35 ATTENTION GETTER
 21 EMORGA EMARNING LAMP
 21 JE MOND CA WARNING INDICATOR
 21 CENTROL OF AWARNING INDICATOR
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- 35 ATTENTION GETTER
 36 MANOEUVRE MONITOR WARNING LAMP
 37 IFF MODE 4 WARNING INDICATOR
 38 APPROACH PROGRESS INDICATOR
 39 REHEAT OPERATING LIGHTS
 40 CLOCK
 41 FLIGHT REFUELLING LIGHTS
 43 STANING LOGHTS

- 41 FLIGHT REFUELLING LIGHTS
 42 STANDBY COMPASS
 42 LANDING GEAR EMERGENCY LOWERING LEVER
 44 EXTERNAL STORES JETTISON CONTROL
 45 SECONDARY CONTROL SURFACES POSITION INDICATOR
 46 LAND/TAXI LIGHTS SWITCH
 47 SERVO ALTIMETER
 48 VERTICAL SPEED INDICATOR
 49 COMBINED SPEED INDICATOR
 50 LANDING GEAR POSITION INDICATOR
 51 NOSE WHEEL STEERING MODE SELECTOR INDICATOR
 52 RADAR ALTIMETER
 53 AUTOPILOTENGAGE INDICATOR
 54 "B" RISK INDICATOR
 55 E-SCOPE RADAR REPEATER DISPLAY (ESRRD)

- 56 ATTITUDE DIRECTION INDICATOR (ADI) 57 HEAD UP DISPLAY (HUD) CONTROL PANEL 58 HEAD UP DISPLAY 59 ENGINE FIRE EXTINGUISHER

- 60 BLANK

- 82 RAPID TAKE OFF PANEL

- 83 CONTROL STICK GRIP 84 RUDDER PEDALS
- 14 13

- 85 RUDDER PEDALS ADJUSTMENT HANDLE
 86 LANDING GEAR SELECTOR LEVER
 87 LANDING GEAR OVERRIDE BUTTON
 88 KRUEGER FLAPS INDICATOR
 89 BRAKES TEST BUTTON
 90 THREE AXES TRIMINDICATOR
 91 BLANK
 92 TACAN CONTROL PANEL
 93 HUD CAMERA CONTROL PANEL
 94 ENGINE CONTROL PANEL
 95 AIR INTAKE RAMPS CONTROL PANEL
 96 TERRAIN FOLLOWING (TER RADAR CONTROL PANEL
 97 INTERNAL LIGHTS CONTROL PANEL
 98 ENGINE TEST PANEL
 99 BLANK
 100 LAMPS TEST PANEL
 101 BLANK
 102 EMERGENCY UHF CONTROL PANEL
 103 ENVIRONMENTAL CONTROL PANEL
 104 IFF CONTROL PANEL
 105 FÜBEL CONTROL PANEL
 106 MICRO-DETONATING CORD (MDC) SAFETY PIN STOWAGE



107 SEAT SAFETY PIN STOWAGE 108 CANOPY SAFETY PIN STOWAGE 108 CANOPY SAFETY PIN STOWAGE 109 EPS SAFETY PIN STOWAGE 110 SEAT LOWER/RAISE SWITCH 111 EXTERNAL LIGHTS PANEL





Tornado GR MK1 (IDS specification)

Type multi-role combat aircraft **Span** minimum sweep 13.9m (45ft 7in); maximum

sweep 8.6m (28ft 2in) Length 16.7m (54ft 9in)

Height 5.7m (18ft 8in)

Weight empty 10,450kg (23,000lb); maximum takeoff with full weapons load 27,200kg (60,000lb) Powerplant Two 6800kg (15,000lb) Turbo Union RB

Powerplant 1 wo 6800kg (15,000lb) 1 urbo Union Ri 199-34R three-shaft afterburning turbofans with integral reversers

Performance maximum speed at sea level Mach 1.2 or 1300km/h (807mph); maximum level speed at 11,000m (36,090ft) over Mach 2.2 or 2335km/h (1450mph)

Range factical radius with full weapons load 1390km (864 miles); ferry range 3890km (2417 miles)

Ceiling 15250m (50,000ft)

Armament two 27mm Mauser IWKA cannon and up to at least 8000kg (17,637lb) of stores, including Sidewinder, Sparrow, Aspide and Sky Flash air-to-air missiles, Maverick and Martel air-to-surface missiles, and Kormoran and P3T anti-ship missiles, plus almost all free-fall tactical bomb types, including a wide variety of cluster bombs, the MW-1 bomblet dispenser and Hobo and Paveway 'smart' bombs

TORNADO ARMAMENTS

GUN

Two 27 mm Mauser cannon

- 360 rounds of ammunition









Opposite above: An ADV prototype, fully armed with four Skyflash missiles slung under the fuselage as well as Sidewinder missiles suspended from the outboard wing pylons beside the long-range fuel tanks. Opposite below: An RAF Tornado practises low-level contour flying over the Scottish Highlands. Above: A Victor tanker aircraft refuels a Tornado in flight; such operations can extend the Tornado's operational range considerably. Above right: A Tornado fires its high-velocity 27 mm Mauser cannon. Centre right: A German Navy Tornado banks to reveal its MW-1 multi-purpose sub-munition dispenser. Below right: Tornados plugged into auxiliary power-unit equipment.







making it practically impossible to detect by groundbased radar and giving maximum protection from surface-to-air missiles and anti-aircraft artillery, due to terrain screening.

In order to achieve high-speed flight at these altitudes, the aircraft must have outstanding handling and control characteristics and, of course, advanced avionics. The Tornado is equipped with an automatic TF (terrain-following) navigation system which controls the flight path of the aircraft to a pre-set clearance height above the ground. Casting a probing radar beam in front of it, the Tornado's TF computer automatically pulls up the aircraft to pass obstructions in its way. Flight-director commands are relayed simultaneously to a visual display, enabling the pilot to override the automatic system at will and put the aircraft under manual control. The system is capable of operation at low-level speeds of up to Mach 1.2 with maximum flight safety. The Ferranti LRMTS (laser ranger and marked target seeker) allows the Tornado to make high-speed, single-pass attacks with extreme accuracy. In an increasingly hostile battlefield environment, the ability of an aircraft to execute successful single-pass attacks against enemy targets and then quickly return to the safety of its home base is of paramount importance if unacceptable losses are to be avoided.

The Tornado's main mission in the advent of war in Europe would be to attack sensitive targets such as airfields, command posts and second echelon concentrations in an interdiction role. The aircraft's speed and survivability, as well as its accurate bomb and missile stores delivery system, give it a high chance of achieving its designated tasks. Once its main stores have been released, the Tornado has an excellent air-to-air combat capability to fight its way back to base.





The ADV has been designed specifically to meet RAF requirements for a long-range interceptor to patrol the East German border and to be able to protect Nato shipping lanes (from the Arctic Circle to the English Channel) against enemy aircraft flying at both high and low levels.

One of the distinguishing features of the ADV – designated the F2 in the RAF – is an air-interception radar known as Foxhunter which is able to detect enemy aircraft at ranges of more than 185km (115 miles), while a long-range visual identification system will allow the Tornado pilot to sort out friend from foe. Although the ADV shares an 80 per cent 'commonality' with the IDS, it differs from the IDS in having an extended forward fuselage, extra fuel, different avionics and armament.

The ADV's extended range/loiter capability and quick supersonic acceleration make it well suited for

its interception role. It can patrol for periods in excess of two hours at distances of up to 650km (400 miles) from its home territory, and carry out an interception mission including 10 minutes of air combat time. Provision is made for air-to-air refuelling from VC-10 tankers while on combat air patrol to extend its patrolling capability. The ADV is fitted with four Sky Flash medium-range missiles and has two Sidewinders and a single 27mm cannon for self-defence. Sky Flash missiles can engage targets at a range of 45km (30 miles) regardless of height.

Its high speed and operational flexibility, combined with sophisticated avionic equipment and powerful armament, make the Tornado a very potent attack aircraft. The Tornado will provide Nato with an effective all-weather counter to the forces of the Warsaw Pact, and it is likely to remain in service to the end of the century at least.

Top: The Tornado in full flight armed with a bomb-load of 1000 lb Mk 83 bombs, and with long-range fuel tanks and ECM pods. Above: A Tornado of the Italian Air Force carrying full external stores during a test flight over the sea.

COMING SOON IN MARKET SOON IN DILACTICAL COMING SOON IN CO

The weapons

The Harrier – an amazing aircraft that proved its worth during the Falklands conflict

The Centurion – thirty years of fighting in this great battle tank
The Hind – firepower and manoeuvrability from the Soviet helicopter gunship

The tactics

Mountain war – how do modern armies adapt to it? Does it favour the guerrilla over the regular soldier?
Street fighting – the dangers of this most risky form of war; house clearing, sniping, barricades

Conflicts that changed the world
Mao takes control of China —
revolutionary ideas and mass armies
Greece — a bitter contest waged by
communists against government forces
Indochina — the start of the longest of
the postwar conflicts

Men in action

Jungle patrol – British conscripts tracking guerrillas in Malayan forests The French Foreign Legion in Vietnam – hardened professionals against merciless guerrillas Fight to the finish – heroism and brutality as the new state of Israel struggled to survive





NEXT WEEK IN ISSUE 3

War in the mountains – where armies fight at the limits of their endurance, supplied by helicopter, mule or porter.

The Harrier – the aircraft that won the air war over the Falklands and whose unique ability to function without a conventional airfield has revolutionised the notion of the fighter.

By far the largest conflict fought in Europe since 1945, **the Greek Civil War** saw an expertly led communist army bring death and destruction to the rugged countryside of Greece, only to be overwhelmed by the firepower of regular forces when it tried to fight set-piece battles.

Eyewitness account – A war correspondent captured by the Greek communists describes the desperate, hunted life of the guerrilla, always struggling to keep one step ahead of his pursuers.

The fighting men – The uniform and equipment of the US Marines who fought in Vietnam.

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